

## 4.3 Partial Removal Alternative

### 4.3.1 Introduction

#### 4.3.1.1 Alternative Description

In the Partial Removal Alternative, sufficient portions of J.C. Boyle, Copco No. 1, Copco No. 2, and Iron Gate dam complexes would be removed to ensure a free-flowing Klamath River and year-round volitional fish passage under all river stages and flow conditions in the Hydroelectric Reach. Ancillary facilities associated with J.C. Boyle, Copco No. 1, Copco No. 2, and Iron Gate dam complexes that do not affect Klamath River flows or volitional fish passage would be abandoned in place. In general, the ancillary facilities to be retained under the Partial Removal Alternative include the Copco No. 1 Powerhouse, penstocks, and intake structure, the Copco No. 2 Powerhouse, steel penstocks and supports, and intake structure, and the lower portion of the Iron Gate Powerhouse (Table 4.3-1, Table 4.3-3, Table 4.3-5). The mechanical and electrical equipment associated with each of the powerhouses would also remain. Penstock openings and powerhouse intakes would be sealed and security fences would be installed around the remaining structures to ensure public safety. Some of the remaining features would likely require ongoing maintenance, including periodic repair and replacement of fencing and repainting/recoating facilities. Detailed lists of features to be retained and new or different construction activities that would be undertaken for the Partial Removal Alternative as compared with the Proposed Project are presented in Table 4.3-2 and Table 4.3-4, and Table 4.3-6.

Other than the aforementioned portions of the Lower Klamath Project dam complexes that would remain under this Partial Removal Alternative, all other aspects would occur as described under the Proposed Project: dam and powerhouse deconstruction, reservoir drawdown, erosion of reservoir sediment deposits during drawdown, restoration within the reservoir footprint, restoration of upland areas, hatchery operations, City of Yreka water supply pipeline relocation, aquatic and terrestrial resource measures, road and bridge improvements/replacements, culvert replacements, recreation facilities removal, traffic management, groundwater well monitoring and replacement, fire management, hazardous material management, emergency response, and noise and vibration control measures (see also Section 2.7 *Proposed Project*).

Table 4.3-1. Copco No. 1 Dam and Powerhouse Removal Under the Partial Removal Alternative.

Feature <sup>1</sup>	National Register Eligibility Recommendation and Reference		Proposed Project (see also Table 2.7-2)	Partial Removal Alternative
	Kramer (2003)	2012 KHSA EIS/EIR		
Concrete Dam	Historic Contributing	Historic Contributing	Remove to elevation 2,463.5 feet, which is 20 feet below original river channel bottom	Same as the Proposed Project
Spillway Gates and Operators, Deck, Piers	No information	No information	Remove	Same as the Proposed Project
<b>Penstocks</b>	Historic Contributing	Historic Contributing	Remove	<b>Seal openings but retain penstocks, install security fence<sup>2</sup></b>
<b>Powerhouse Intake Structure</b>	No information	No information	Remove	<b>Seal openings but retain powerhouse intake structure, install security fence<sup>2</sup></b>
Gate Houses on Right Abutment	Historic Contributing	Historic Contributing	Remove	Same as the Proposed Project <sup>3</sup>
Diversion Control Structure	No information	No information	Remove	Same as the Proposed Project <sup>4</sup>
Tunnel Portals <sup>5</sup>	No information	No information	Retain the tunnel, plug the tunnel portals with reinforced concrete <sup>5</sup>	Same as the Proposed Project <sup>5</sup>
<b>Powerhouse (including mechanical and electrical equipment)</b>	Historic Contributing	Historic Contributing	Remove	<b>Retain, install security fence. Powerhouse would remain in the 100-year floodplain<sup>2,6</sup></b>
Powerhouse Hazardous Materials (including transformers, batteries, insulation)	No information	No information	Remove	Same as the Proposed Project
Four 69-kv Transmission Lines (3.03 miles total) (including poles and transformers)	No information	No information	Remove	Same as the Proposed Project
Switchyard	No information	No information	Remove	Same as the Proposed Project
Warehouse and Residence <sup>7</sup>	Historic Contributing	Historic Contributing	Remove	Same as the Proposed Project

<sup>5</sup> Feature as presented in Appendix B: *Definite Plan – Table 5.3-1.*

<sup>6</sup> Some of the features proposed to be retained under the Partial Removal Alternative may have coatings that contain heavy metals (such as the penstocks) and that could be exposed during or following construction activities. These features would require preservation under the Partial Removal to reduce the risk of environmental contamination.

<sup>7</sup> While it would be possible to partially remove the gate houses, they are likely to be fully removed to facilitate construction access (e.g., to allow a large crane to access the site). For the purposes of this CEQA analysis, it is assumed that the gate houses would be fully removed.

<sup>8</sup> The existing diversion control structure includes gate hoists, stems, and wire ropes, which would be demolished along with unstable concrete as part of modifying the diversion structure prior to reservoir drawdown. Proposed features to modify the diversion control structure (i.e., new downstream tunnel gate and portal, new upstream blind flanges) to facilitate reservoir drawdown would be removed as part of dam deconstruction activities.

<sup>9</sup> Refers to the Diversion Tunnel shown in Figure 2.7-2.

<sup>10</sup> Retention of the Copco No. 1 Powerhouse under the Partial Removal Alternative would require the structure to be sealed and fenced, unless developed for public benefit as a historic structure (using an alternative funding source).

<sup>11</sup> Refers to the Maintenance Building and the North and South Residences shown in Figure 2.7-2.

**Table 4.3-2. Copco No. 1 Features<sup>1</sup> to be Retained and New or Different Construction Activities Under the Partial Removal Alternative as Compared with the Proposed Project.**

Retain concrete intake structure on right abutment	Retain station service 600-volt switchgear
Retain diversion tunnel control structure concrete	Retain unit and plant control switchboard
Retain three sections of 23-foot by 72-inch diameter steel lining	Retain raceways, conduit and cable
Retain three 72-inch butterfly valves	Retain miscellaneous power and control boards
Retain powerhouse concrete down to top of rock under the powerhouse	Retain indoor, oil-filled, step-up, 1-phase, 5000 kilo-volt ampere (kVA) transformers
Retain powerhouse structural steel	Retain seven 40-ton indoor travelling crane motors
Retain two governor oil systems	Retain 40-ton indoor travelling crane control
Retain cooling water and bearing oil systems	Retain 40-ton indoor travelling crane festoon cable
Retain four horizontal tandem Francis turbines	Retain four 15-ton overhead crane motors
Retain two 40-ton indoor travelling cranes	Retain 15-ton overhead crane control
Retain compressed air system	Retain 15-ton overhead crane festoon
Retain two CO <sub>2</sub> systems	Retain concrete items associated with 10 foot-diameter penstock
Retain plant water and fire protection	No plugging of the 14-foot diameter penstock with concrete
Retain transformer oil fire protection	Retain 8 screens
Retain unwatering piping	Retain 8 water gates
Retain drainage piping	Retain three 30-inch diameter by 25-foot stand pipes
Retain horizontal 12 mega-volt ampere (MVA) generator	Retain 14-foot diameter penstock pipe
Retain excitation equipment for 12 MVA generator	Retain 10-foot diameter penstock pipe
Retain surge protection equipment for 12 MVA generator	Seal openings in the penstocks, powerhouse intake structure, and powerhouse
Retain neutral grounding equipment for 12 MVA generator	Install security fencing around penstocks, powerhouse intake structure, and powerhouse

<sup>1</sup> Feature description using information presented in Appendix B: *Definite Plan – Appendix P – Attachments A.1 and A.2.*

Table 4.3-3. Copco No. 2 Dam and Powerhouse Removal Under the Partial Removal Alternative.

Feature <sup>1</sup>	National Register Eligibility Recommendation and Reference		Proposed Project (see also Table 2.7-4)	Partial Removal Alternative
	Kramer (2003)	2012 KHSA EIS/EIR		
Concrete Dam	Historic Contributing	Historic Contributing	Remove	Same as Proposed Project
Spillway Gates, Structure	Historic Contributing	No Information	Remove	Same as Proposed Project
<b>Power Penstock Intake Structure and Gate</b>	Historic Contributing	Historic Contributing	Remove	<b>Seal openings but retain power penstock intake structure and gate, install security fence<sup>2</sup></b>
<b>Tunnel Portals<sup>3</sup></b>	Historic Contributing	Historic Contributing	Retain the tunnel, plug the tunnel portals with reinforced concrete <sup>2</sup>	<b>Same as Proposed Project but retain and close intake structure gate<sup>2</sup></b>
Embankment Section and Right Sidewall	No Information	No Information	Remove	Same as Proposed Project
Basin Apron and End Sill	No Information	No Information	Remove	Same as Proposed Project
Remnant Cofferdam Upstream of Dam	Historic Contributing	Historic Contributing	Remove	Same as Proposed Project
Wood-stave Penstock	Historic Contributing	Historic Contributing	Remove	Same as Proposed Project
Concrete Pipe Cradles	No Information	No Information	Remove	Same as Proposed Project
<b>Steel Penstock, Supports, Anchors</b>	Historic Contributing <sup>4</sup>	Historic Contributing <sup>4</sup>	Remove	<b>Seal openings but retain penstock, supports, and anchors, install security fence<sup>2</sup></b>
<b>Powerhouse (including mechanical and electrical equipment)</b>	Historic Contributing	Historic Contributing	Remove	<b>Retain, seal openings, install security fence<sup>2,5</sup></b>
Powerhouse Hazardous Materials (including transformers, batteries, insulation)	No Information	No Information	Remove	Same as Proposed Project
Powerhouse Control Center Building and Maintenance Building	Non-Contributing	No Information	Remove	Same as Proposed Project
Oil and Gas Storage Building	Historic Contributing	No Information	Remove	Same as Proposed Project
69-kV Transmission Line, 0.14 mile	No Information	No Information	Remove	Same as Proposed Project

Feature <sup>1</sup>	National Register Eligibility Recommendation and Reference		Proposed Project (see also Table 2.7-4)	Partial Removal Alternative
	Kramer (2003)	2012 KHSA EIS/EIR		
Switchyard	Non-Contributing <sup>6</sup>	No Information	Retain – the switchyard is not part of the Proposed Project	Same as Proposed Project
Tailrace Channel	No Information	No Information	Backfill <sup>2</sup>	Same as Proposed Project <sup>2</sup>
Copco Village, Copco No. 2 Cookhouse/Bunkhouse	Historic Contributing	No Information	Remove	Same as Proposed Project
Copco Village, Bungalow Housing (bungalow and garage)	Historic Contributing	No Information	Remove	Same as Proposed Project
Copco Village (including modern bunkhouse, garage/ storage building, three modular houses, four ranch-style houses, and schoolhouse/community center) <sup>7</sup>	Non-Contributing	No Information	Remove	Same as Proposed Project

<sup>1</sup> Feature as presented in Appendix B: *Definite Plan – Table 5.4-1*.

<sup>2</sup> Some of the features proposed to be retained under the Partial Removal Alternative may have coatings that contain heavy metals (such as the penstocks) and that would be exposed during or following construction activities. These features would require preservation under the Partial Removal to reduce the risk of environmental contamination.

<sup>3</sup> Refers to Conveyance Tunnel and Overflow Spillway Tunnel shown in Figure 2.7-2.

<sup>4</sup> Supports and anchors not specified as part of the National Register Eligibility Recommendation.

<sup>5</sup> Located within the FEMA designated 100-year floodplain under existing conditions (FEMA 2011a).

<sup>6</sup> Switchyard labeled as the Copco No. 2 Substation in Kramer (2003).

<sup>7</sup> For the purposes of this CEQA analysis, Copco Village facilities also includes the water tower shown in Figure 2.7-2.

Table 4.3-4. Copco No. 2 Features<sup>1</sup> to be Retained and New or Different Construction Activities Under the Partial Removal Alternative as Compared with the Proposed Project.

No removal of water from behind tailrace cofferdam	Retain indoor, vertical alternating current generator
No dewatering behind tailrace cofferdam	Retain excitation equipment for 15 milli-volt ampere (MVA) generator
No construction of embankment cofferdam across tailrace	Retain surge protection equipment for 15 MVA generator
Retain right abutment random fill	Retain neutral grounding equipment for 15 MVA generator
Retain right abutment hand-placed riprap	Retain switchgear for equipment for 15 MVA generator
Retain right abutment gunite curtain wall	Retain station service 600-volt switchgear
Retain copper shingles from roof of powerhouse	Retain unit and plant control switchboard
Retain powerhouse concrete down to spring-line of turbine	Retain battery system
Retain structural steel items associated with powerhouse	Retain raceways, conduit and cable
Retain shop building	Retain miscellaneous power and control boards
Retain two governor oil systems	Retain seven 40-ton travelling crane motors hoists
Retain cooling water and bearing oil systems	Retain 40-ton travelling crane controls
Retain oil/water separator tank and piping	Retain 40-ton travelling crane festoon cables
Retain 12 cast iron columns	Retain intake structure concrete
Retain two Francis turbines	Retain concrete items associated with 16-foot inner diameter wood penstock
Retain two 40-ton indoor cranes	Retain concrete items associated with penstocks
Retain compressed air systems	Retain steel caterpillar gate
Retain two CO2 systems	Retain steel trash rack and trash rake
Retain plant water and fire protection	Retain steel stop logs and slots for intake
Retain transformer oil fire protection	Retain penstock after bifurcation to butterfly
Retain unwatering piping	Retain bifurcated vent pipes and support
Retain drainage piping	Retain two 138-inch butterfly valves
Seal openings in the penstocks, powerhouse intake structure, and powerhouse	Install security fencing around penstocks, powerhouse intake structure, and powerhouse

<sup>1</sup> Feature description using information presented in Appendix B: *Definite Plan – Appendix P – Attachments A.1 and A.2.*

Table 4.3-5. Iron Gate Dam and Powerhouse Removal Under the Partial Removal Alternative.

Feature <sup>1</sup>	National Register Eligibility Recommendation and Reference		Proposed Project (see also Table 2.7-6)	Partial Removal Alternative
	Kramer (2003)	2012 KHSA EIS/EIR		
Embankment Dam, Cutoff Walls	Non-Contributing	Historic Contributing	Remove	Same as Proposed Project
Penstock Intake Structure and Footbridge	Non-Contributing	Historic Contributing	Remove	Same as Proposed Project
Penstock	Non-Contributing	Historic Contributing	Remove	Same as Proposed Project
Water Supply Pipes and Aerator	No Information	No Information	Remove	Same as Proposed Project
Spillway Structure	Non-Contributing	Historic Contributing	Retain and bury to extent practicable <sup>2</sup>	Same as Proposed Project <sup>2</sup>
<b>Powerhouse (including mechanical and electrical equipment)</b>	Non-Contributing	Historic Contributing	Remove	<b>Retain lower portion of the powerhouse and seal openings, remove upper portion of the powerhouse<sup>3</sup></b>
Powerhouse Hazardous Materials (transformers, batteries, insulation)	No Information	No Information	Remove	Same as Proposed Project
Powerhouse Tailrace Area	No Information	No Information	Backfill <sup>2</sup>	Same as Proposed Project <sup>2</sup>
Fish Facilities on Dam (fish ladder and trapping and holding facilities)	Non-Contributing	Historic Contributing	Remove	Same as Proposed Project
Fish Hatchery	Non-Contributing	No Information	Fish ladder and holding tanks at the toe of the dam would be removed, as would the cold-water supply for the hatchery; these facilities would be relocated such that the hatchery remains operational for eight years after the removal of Iron Gate Dam (see also Section 2.7.6)	Same as Proposed Project

Feature <sup>1</sup>	National Register Eligibility Recommendation and Reference		Proposed Project (see also Table 2.7-6)	Partial Removal Alternative
	Kramer (2003)	2012 KHSA EIS/EIR		
Switchyard	No Information	No Information	Remove	Same as Proposed Project
69-kV Transmission Line, 0.5 mi	No Information	No Information	Remove	Same as Proposed Project
Diversion Tunnel Intake Structure and Footbridge	Non-Contributing	No Information	Remove	Same as Proposed Project
Diversion Tunnel and Portals	Non-Contributing	No Information	Retain the tunnel, plug the tunnel portals with reinforced concrete <sup>2</sup>	Same as Proposed Project <sup>2</sup>
Diversion Tunnel Control Tower, Hoist, and Gate	Non-Contributing	No Information	Remove above finished-grade portion and retain below finished-grade portion <sup>2</sup>	Same as Proposed Project <sup>2</sup>
Additional Ancillary Facilities (e.g., communication buildings, restrooms and two residences) <sup>4</sup>	Non-Contributing	Historic Contributing <sup>5</sup>	Remove	Same as Proposed Project

<sup>1</sup> Feature as presented in Appendix B: *Definite Plan – Table 5.5-1*.

<sup>2</sup> Some of the features proposed to be retained under the Partial Removal Alternative may have coatings that contain heavy metals (such as the penstocks) and that could be exposed during or following construction activities. These features would require preservation under the Partial Removal to reduce the risk of environmental contamination.

<sup>3</sup> Located within the FEMA designated 100-year floodplain under existing conditions (FEMA 2011b).

<sup>4</sup> These facilities are discernible in Figure 2.7-4 although they not itemized in Appendix B: *Definite Plan – Table 5.5-1*.

<sup>5</sup> National Register Eligibility Recommendation only applies to the communication building and restroom. No recommendation made for the two residences.

**Table 4.3-6.** Iron Gate Features<sup>1</sup> to be Retained and New or Different Construction Activities Under the Partial Removal Alternative as Compared with the Proposed Project.

No furnishing, installing, and then removing temporary air vent hose from barge to diversion tunnel intake structure	Retain drainage piping
No removal of water from behind tailrace cofferdam	Retain transformer oil and fire protection
No dewatering behind tailrace cofferdam	Retain compressed air system
No construction of embankment cofferdam across tailrace	Retain outdoor horizontal generator
Retain powerhouse concrete	Retain excitation equipment for 18.975 milli-volt ampere (MVA) generator
Retain turbine unit	Retain surge protection equipment for 18.975 MVA generator
Retain draft tube bulkheads	Retain neutral grounding equipment for 18.975 MVA generator
Retain crane	Retain station service 600-volt switchgear
Retain governor oil system	Retain unit and plant control switchboard
Retain bearing oil system and cooling water system	Retain raceways, bus, conduit and cable
Retain CO <sub>2</sub> systems	Retain miscellaneous power and control boards
Retain plant water and fire protection	Retain 3-phase, 275-kilo-volt ampere (kVA) transformer
Retain sump pumps	Retain governor oil pump motors
Retain pumps	Seal openings in the penstocks, powerhouse intake structure, and powerhouse
Retain exposed piping around the powerplant	Install security fencing around penstocks, powerhouse intake structure and powerhouse
Retain unwatering piping	

<sup>1</sup> Feature description using information presented in Appendix B: *Definite Plan – Appendix P – Attachments A.1 and A.2.*

#### 4.3.1.2 Alternative Analysis Approach

Like the Proposed Project analysis in Section 3, the potential impacts of the Partial Removal Alternative are analyzed in comparison to existing conditions. Unless otherwise indicated, the significance criteria, area of analysis, environmental setting, and impact analysis approach, including consideration of existing local policies, for all environmental resource areas under the Partial Removal Alternative are the same as those described for the Proposed Project (see Section 3.1 *Introduction* and individual resource area subsections in Section 3 *Environmental Setting, Potential Impacts, and Mitigation Measures*). Most potential impacts for each environmental resource area are analyzed both in the short term and the long term, and unless otherwise indicated, use the same definitions of short term and long term as described for each resource area analyzed for the Proposed Project.

Based upon the detailed list of features that would be retained under the Partial Removal Alternative (Table 4.3-2 and Table 4.3-4, Table 4.3-6), the analysis of this alternative assumes that deconstruction techniques are the same as for the Proposed Project, with

no specialized means or methods necessary. The analysis also assumes that the Partial Removal Alternative would use the same equipment as the Proposed Project. This alternative would require time to secure retained facilities by removing hazardous materials and installing fences and similar security features to prevent unwanted entry, such that the Partial Removal Alternative would adhere to the same schedule as the Proposed Project (Table 2.7-1).

The Definite Plan (Appendix B: *Definite Plan*) does not describe how openings in the penstocks, powerhouse intake structures, and powerhouse would be sealed, or how much security fencing would be needed under the Partial Removal Alternative. This alternative assumes that penstock openings would be sealed with reinforced concrete to eliminate trespass concerns.

Assuming a 100-foot buffer around each of the retained structures, approximately 3,100 linear feet of fencing would be installed. There would be an estimated six openings to seal for the three Copco No. 1 steel penstock pipes, and an estimated two openings to seal for the Copco No. 2 steel penstock. There would be an unknown number of openings to seal for the powerhouses; however, combined with the penstock openings, the total amount of area to be sealed and the construction-related effort to do so, including waste disposal and materials import, would be considerably less than the construction-related effort saved by not demolishing and processing waste from the numerous features listed in Table 4.3-2, Table 4.3-4, and Table 4.3-6, and in particular the multiple 40-ton travelling indoor cranes and 15-ton overhead cranes from Copco No. 1 and Copco No. 2 powerhouses, approximately 1,400 feet of steel penstocks for Copco No. 1 and Copco No. 2 powerhouses, and the concrete for the bottom portion of the Iron Gate Powerhouse.

This analysis also assumes that excavation and cut/fill activities associated with the Partial Removal Alternative would be lower than the Proposed Project because the footprint on which equipment would be operating is smaller (Appendix N – *Section N.3.2 Emissions from the Partial Removal Alternative*). However, emissions associated with the other construction-related activities would be relatively unaffected because the peak number of truck trips, construction equipment, and temporary workers would not substantially change between the Proposed Project and this alternative because the remaining structures will require sealing of penstocks, intake structures, and powerhouses, and security fence installation.

#### 4.3.2 Water Quality

The Partial Removal Alternative would have the same level of significance for potential impacts on water quality as those identified under the Proposed Project. While partial removal of the Lower Klamath Project dam complexes would reduce construction activities due to some structures remaining in place (Table 4.3-1 through Table 4.3-6), the majority of the Lower Klamath Project dam complexes would still be removed under this alternative, including the entirety of each dam. Sealing of openings in the penstocks, powerhouse intake structures, and powerhouses, and installation of security fencing around the remaining features would require some degree of materials import (i.e., sealing materials, fencing). Compared with the Proposed Project, the same degree of mobilization of Lower Klamath Project reservoir sediment deposits would occur. Although there would be a decrease in construction-related activities under the Partial Removal Alternative due to some Lower Klamath Project structures remaining in place, the degree of difference would not be sufficient to significantly reduce water quality

impacts identified for the Proposed Project or any potential mitigation measures. Water quality impacts under the Partial Removal Alternative (i.e., water temperature-related: Potential Impact 3.2-1 and 3.2-2; suspended sediment-related: Potential Impact 3.2-3 through to 3.2-6; nutrient-related: Potential Impact 3.2-7 and 3.2-8; dissolved oxygen-related: Potential Impact 3.2-9 and 3.2-10; pH-related: Potential Impact 3.2-11; chlorophyll-a and algal toxins-related: Potential Impact 3.2-12; and inorganic and organic contaminant-related: Potential Impact 3.2-13 to 3.2-16; general water quality-related: Potential Impact 3.2-17 and 3.2-18) would be the same as the Proposed Project.

### 4.3.3 Aquatic Resources

#### 4.3.3.1 Key Ecological Attributes

Although there would be a decrease in construction-related activities under the Partial Removal Alternative due to several of the Lower Klamath Project structures remaining in place (Table 4.3-1 through Table 4.3-6), the degree of difference would not be sufficient to significantly reduce the potential effects of dam removal on key aquatic ecological attributes (e.g., suspended sediment, bedload, water quality, disease and parasites, algal toxins, aquatic habitat, and instream flows). Thus, effects on key ecological attributes under the Partial Removal Alternative would be indistinguishable from those described for the Proposed Project.

#### 4.3.3.2 Aquatic Resource Impacts

Like under the Proposed Project, reservoir drawdown associated with dam removal under the Partial Removal Alternative could directly impact aquatic species. In addition, the removal of dams and reservoirs could alter the availability and quality of habitat, resulting in direct and indirect effects on aquatic species. Although the Partial Removal Alternative would leave some Lower Klamath Project structures in place (Table 4.3-1 through Table 4.3-6), the entirety of each dam would be removed to ensure a free-flowing Klamath River and year-round volitional fish passage under all river stages and flow conditions. Under the Partial Removal Alternative, hatchery operations would continue with reduced production for eight years following dam removal, as described for the Proposed Project (Section 2.7.6 *Hatchery Operations*). Although there would be some decrease in construction-related activities under the Partial Removal Alternative due to some Lower Klamath Project structures remaining in place, the degree of difference would not be sufficient to significantly reduce water quality impacts identified for the Proposed Project. Therefore, the potential impacts to aquatic resources, and the potential mitigation measures, would be the same as those described for the Proposed Project (Potential Impacts 3.3-1 through 3.3-24).

#### 4.3.4 Phytoplankton and Periphyton

Although the Partial Removal Alternative would leave some Lower Klamath Project structures in place (Table 4.3-1 through Table 4.3-6), the entirety of each dam would be removed to ensure a free-flowing Klamath River under all river stages and flow conditions. The hydrologic processes, suspended sediment transport, and nutrient conditions affecting phytoplankton and periphyton growth will therefore be the same under the Proposed Project and the Partial Removal Alternative. As such, the potential impacts to phytoplankton and periphyton (Potential Impact 3.4-1 through 3.4-5) due to

implementation of the Partial Removal Alternative would be the same as those described for the Proposed Project.

#### 4.3.5 Terrestrial Resources

##### 4.3.5.1 Vegetation Communities

Under the Partial Removal Alternative there would be less construction activity as compared to the Proposed Project, since some structures would remain in place (see Table 4.3-1 through Table 4.3-6); however, there would still be construction activities in areas where there are sensitive habitats under existing conditions (Section 3.5.2.1 *Vegetation Communities*). Consequently, short-term impacts on sensitive habitats would be similar to those described for the Proposed Project (Potential Impacts 3.5-1 and 3.5-2), including impacts on wetlands and riparian habitats along the Lower Klamath Project reservoirs, river reaches (i.e., Hydroelectric Reach and the Middle Klamath River immediately downstream of Iron Gate Dam), and locations associated with bridges to be replaced or upgraded prior to reservoir drawdown. Implementation of Mitigation Measure TER-1 would reduce these potential short-term impacts to less than significant.

Additionally, under the Partial Removal Alternative, there may be short- and long-term impacts on wetland and riparian habitat due to reservoir drawdown and dam removal, similar to those of the Proposed Project (Potential Impacts 3.5-3 through 3.5-6). Proposed activities contained within the Reservoir Area Management Plan (Appendix B: *Definite Plan – Appendix H*), in combination with natural recruitment of riparian habitat along newly-formed tributary reaches within the former reservoir footprint, may result in a net increase in the areal extent of riparian habitat within the terrestrial resources Area of Analysis (Potential Impact 3.5-5). Furthermore, as with the Proposed Project, loss of riparian habitat from sedimentation downstream of the dams would be short-term in nature. Overall, short-term and long-term impacts on wetland and riparian habitat from implementation of the Partial Removal Alternative would be less than significant.

##### 4.3.5.2 Culturally Significant Species

Similar to the Proposed Project, many of the species identified by the Native American Tribes in the Klamath River region as culturally significant occur in riparian and wetland habitats. The goal of no net loss of wetland or riparian habitat acreage and functions would still apply under the Partial Removal Alternative, and the revegetation mixes would be developed based on updated inventories of existing wetland and riparian vegetation around the reservoir perimeters; therefore, culturally significant species would be documented and incorporated as part of the revegetation effort. In addition, Mitigation Measure TER-1 (see Potential Impact 3.5-1) includes wetland buffers to prevent intrusion in wetland habitats, deter heavy machinery from traversing the wetland, prevent runoff pollution from directly entering the wetland, and avoid substantial degradation in these areas. These measures would reduce short- and long-term impacts on culturally significant species to less than significant under this alternative.

##### 4.3.5.3 Special-status Species

Under the Partial Removal Alternative there would be less construction activity as compared to the Proposed Project as some structures would remain in place (see Table 4.3-1 through Table 4.3-6); however, short-term construction-related noise would still be

generated due to the removal of the large majority of the dam complexes, including the entirety of each dam, and sealing of remaining structures and installation of security fencing. Thus, retaining some structures under the Partial Removal Alternative would not reduce noise-related impacts on special-status bats or birds to a less than significant level. Although bats are known to use some of the structures that would be retained (i.e., Copco No. 1, Copco No. 2, and Iron Gate powerhouses, see Section 3.5.5.3 *Special-status Species and Rare Natural Communities*), the Partial Removal Alternative would seal openings in the structures that remain, which would prevent bats from accessing the inside of the structures.

The structures that currently support the largest of the known bat roosts (e.g., Copco No. 1 and Iron Gate diversion tunnels) would be removed under this alternative. Birds may be nesting on the exterior of the structures that would be retained and potentially affected by facility preservation. As such, short- and long-term construction-related potential impacts (Potential Impacts 3.5-9, 3.5-10, 3.5-11, 3.5-12, 3.5-13, 3.5-14, 3.5-15, and 3.5-28) on terrestrial resources would be the same as those described for the Proposed Project. The mitigation measures and recommended terrestrial measures also would be the same as those identified for the Proposed Project.

Similarly, even though there would be less construction activity under the Partial Removal Alternative as compared to the Proposed Project, special-status plants and rare natural communities may be present in the areas where construction activities may be performed. Consequently, short-term impacts on special-status plants and rare natural communities may would be similar to those of the Proposed Project (Potential Impacts 3.5-7 and 3.5-8). The same terrestrial resource measures would apply as under the Proposed Project, which would include surveys for special-status species and rare natural communities, implementation of avoidance measures and invasive species control (Appendix B: *Definite Plan – Appendix J*). There may be significant impacts on special-status plants where avoidance is infeasible and if replanting does not succeed in re-establishment of new populations; therefore, recommended measures would be the same as those identified for the Proposed Project.

Short-term impacts of high SSCs and flows, as they relate to special-status amphibian and reptile species (Potential Impacts 3.5-16 and 3.5-18), would also be the same under the Partial Removal Alternative as those described under the Proposed Project, since retaining some structures would not affect proposed reservoir drawdown rates or the degree of mobilization of Lower Klamath Project reservoir sediment deposits.

For the same reasons as described under the Proposed Project, there would be the potential short- and long-term impacts due to loss of aquatic reservoir, wetland, and riparian habitats (Potential Impact 3.5-8) under the Partial Removal Alternative. However, as discussed under the Proposed Project, implementation the Reservoir Area Management Plan (Appendix B: *Definite Plan – Appendix H*) in combination with natural recruitment along newly-formed tributary reaches within the former reservoir footprint may result in a net increase in the areal extent of riparian habitat within the terrestrial resources Area of Analysis (Potential Impact 3.5-5). The extent of both impacts and remediation would be functionally the same under both the Proposed Project and the Partial Removal Alternative. Therefore, short- and long-term potential impacts on special-status plants (Potential Impacts 3.5-9) and special-status wildlife (Potential Impacts 3.5-15, 3.5-17, 3.5-19–22, and 3.5-24) would be similar to those described for the Proposed Project and recommended measures would be the same.

Under this alternative, Iron Gate Hatchery would operate with reduced production goals, Fall Creek Hatchery would be reopened, and water would be diverted from Bogus Creek and Fall Creek as described under the Proposed Project; thus, potential construction-related impacts, impacts from loss of hatchery production on wildlife, and flow diversion impacts would be the same as those described under the Proposed Project (Potential Impacts 3.5-10 3.5-25, 3.5-26, and 3.5-27).

#### 4.3.5.4 Wildlife Corridors and Habitat Connectivity

Retaining some structures (Table 4.3-1 through Table 4.3-6) under the Partial Removal Alternative would result in no change from existing conditions. Effects on wildlife corridors and habitat connectivity would be slightly less beneficial in terms of opening migration opportunities than those described for the Proposed Project because the steel penstocks would remain and may impede wildlife migration. The largest length of parallel penstocks that would remain at Copco No. 1 is approximately 230 feet and at Copco No. 2 is approximately 410 feet. Powerhouses and intake structures that would remain do not present a migration barrier under existing conditions. There would be long-term benefits to wildlife from gains in upland and riparian habitat following establishment of newly planted areas, which would include monitoring and control of invasive plants (see Reservoir Area Management Plan [Appendix B: *Definite Plan – Appendix H*]). Drawdown of the reservoirs and removing the dams would benefit some terrestrial species by eliminating migration barriers, as described above (Potential Impacts 3.5-23, 3.5-29, and 3.5-30).

#### 4.3.6 Flood Hydrology

Although the Partial Removal Alternative would leave some Lower Klamath Project structures in place (see Table 4.3-1 through Table 4.3-6), the entirety of each dam would be removed to ensure a free-flowing Klamath River under all river stages and flow conditions. The retained Copco No. 1, Copco No. 2, and Iron Gate powerhouses would likely remain within the 100-year floodplain after dam removal, based on their position within the current FEMA designated 100-year floodplain (FEMA 2011a,b) and there would be no change from existing conditions with respect to flood risk for the remaining powerhouse structures. Overall, the potential flood hydrology impacts of the Partial Removal Alternative would be the same as those described for the Proposed Project and there would be no significant impacts for Potential Impacts 3.6-1, 3.6-2, and 3.6-4 through 3.6-6 (short term). For reasons described under the Proposed Project, the long-term effect of this alternative would be beneficial for Potential Impact 3.6-6. There would be significant and unavoidable impacts related to exposing structures to a substantial risk of damage due to flooding downstream of the location of Iron Gate Dam (Potential Impact 3.6-3).

#### 4.3.7 Groundwater

The retention of some structures under the Partial Removal Alternative (e.g., powerhouse elements, penstocks, some buildings, see also Table 4.3-1 through Table 4.3-6) would not result in different impacts to groundwater resources compared with those described for the Proposed Project. Thus, the potential impacts of the Partial Removal Alternative on groundwater would be the same as those described for the

Proposed Project (Potential Impacts 3.7-1 and 3.7-2) and there would be no significant impacts.

#### 4.3.8 Water Supply/Water Rights

The retention of some structures under the Partial Removal Alternative (e.g., powerhouse elements, penstocks, some buildings, see also Table 4.3-1 through Table 4.3-6) would not result in different impacts to water supply/water rights compared with those described for the Proposed Project. Thus, the potential impacts of the Partial Removal Alternative on water supply/water rights, and the potential mitigation measures, would be the same as those described for the Proposed Project. Potential Impacts 3.8-1, 3.8-2, and 3.8-5 would result in no significant impacts.

Under the Partial Removal Alternative, the same degree of mobilization of Lower Klamath Project reservoir sediment deposits would occur as under the Proposed Project, such that release of stored sediment during reservoir drawdown could still impact water intake pumps downstream from Iron Gate Dam (Potential Impact 3.8-3). As under the Proposed Project, implementation of Mitigation Measure WSWR-1 would reduce this potential impact to less than significant.

The City of Yreka's municipal water supply pipeline would still need to be relocated following drawdown of Iron Gate Reservoir (Potential Impact 3.8-4), and there would still be potential for disruption to the City's water supply. Implementation of Mitigation Measure WSWR-2 would reduce this potential impact to less than significant.

#### 4.3.9 Air Quality

Although there would be a decrease in construction-related activities under the Partial Removal Alternative due to several of the Lower Klamath Project structures remaining in place (Table 4.3-1 through Table 4.3-6), the degree of difference would not be sufficient to significantly reduce the potential effects of dam removal on construction-related air quality impacts described for the Proposed Project (Potential Impacts 3.9-1 through 3.9-5). With respect to potential exceedances of the Siskiyou County Air Pollution Control District (SCAPCD) emissions thresholds in Rule 6.1 (Construction Permit Standards for Criteria Air Pollutants) (Potential Impact 3.9-2), estimated total daily emissions from the Partial Removal Alternative would still exceed the SCAPCD's significance thresholds for NO<sub>x</sub>, PM<sub>10</sub>, and PM<sub>2.5</sub> (Table 4.3-7). While there would be less excavation and cut/fill activities than the Proposed Project due to the smaller construction footprint, emissions associated with the other project activities would be relatively unaffected because the peak number of truck trips, amount of construction equipment, and number of temporary workers does not substantially change between the Proposed Project and this alternative. As such, the construction emissions from the Partial Removal Alternative would be significant.

As with the Proposed Project, since the Yreka water pipeline relocation would occur prior to initiating drawdown of the Iron Gate Reservoir, the construction emissions from this activity do not have the potential to occur at the same time as the other activities and should be considered separately. As shown in Table 4.3-7, the emissions from the relocation of the Yreka water supply pipeline as an isolated activity would be below the significance criteria.

Table 4.3-7. Uncontrolled Daily Emissions for the Partial Removal Alternative.<sup>1</sup>

Project Activity	Peak Daily Emissions (pounds per day) <sup>2</sup>					
	VOC	CO	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
Dam and Powerhouse Deconstruction	128	570	625	9	484	244
Restoration Activities	19	62	168	20	3	3
Recreation Facilities	12	77	85	0	17	7
Yreka Water Supply Pipeline Relocation	3	16	18	0	10	3
Total Maximum Daily	162	725	<b>896</b>	29	<b>514</b>	<b>257</b>
Significance Criterion <sup>2</sup>	250	2,500	250	250	250	250

Source: Appendix N

Notes:

<sup>1</sup> Values shown in grey highlight exceed the Siskiyou County Air Pollution Control District's (SCAPCD) thresholds of significance in Rule 6.1 (Construction Permit Standards for Criteria Air Pollutants).

Key:

VOC = volatile organic compounds  
CO = carbon monoxide  
NO<sub>x</sub> = nitrogen oxides  
SO<sub>2</sub> = sulfur dioxide  
PM<sub>10</sub> = inhalable particulate matter  
PM<sub>2.5</sub> = fine particulate matter

As discussed for the Proposed Project (Potential Impact 3.9-2), the KRRC's current proposal lacks sufficient detail concerning construction activities and it is too speculative to determine whether the air quality mitigation measures proposed in the 2012 KHSA EIS/EIR are feasible and enforceable. As such, the analysis of the Partial Removal Alternative does not include mitigation to minimize impacts from construction emissions generated by the alternative's activities. Since similar minimization measures may be implemented during project construction, it is assumed that the emissions generated by the Partial Removal Alternative would fall somewhere in the range between the uncontrolled and mitigated emissions estimates contained in Appendix N. Due to this uncertainty, the emissions of NO<sub>x</sub>, PM<sub>10</sub>, and PM<sub>2.5</sub> from the Partial Removal Alternative are found to be significant and unavoidable.

#### 4.3.10 Greenhouse Gas Emissions

The Partial Removal Alternative would result in few direct operational greenhouse gas (GHG) emissions. As noted for the Proposed Project (see Potential Impact 3.10-1), direct GHG emissions associated with operation of the Iron Gate Hatchery and Fall Creek Hatchery are assumed to be the same as existing baseline GHG emissions associated with current hatchery operations. Appreciable direct GHG emissions would occur only for a limited time as a result of construction related to dam deconstruction, restoration, relocation and demolition of recreational facilities, Yreka supply pipeline relocation. Since uncontrolled direct total GHG emissions from construction-related and restoration activities under the Proposed Project would be approximately 9,455 MTCO<sub>2e</sub> (Table 3.10-2), which is below the SCAQMD's 10,000 MTCO<sub>2e</sub> significance threshold, any decrease in emissions due to less construction-related and restoration activity emissions under the Partial Removal Alternative, however small, would also result in a less than significant impact.

The removal of power production is the same under both the Proposed Project and the Partial Removal Alternative. The potential for indirect production of GHG emissions under the Partial Removal Alternative would be less than significant because this alternative would not affect PacifiCorp plans to add new sources of renewable power or purchase renewable energy credits (RECs) to comply with the California Renewable Portfolio Standard (RPS) (PacifiCorp 2017b), and removal of the reservoirs would still occur which would result in a reduction in methane production (Potential Impact 3.10-2).

#### 4.3.11 Geology, Soils, and Mineral Resources

Under the Partial Removal Alternative, removal of the Lower Klamath Project embankment/earth-filled dam and concrete dam structures would still occur to ensure a free-flowing Klamath River under all river stages and flow conditions. Thus, compared with the Proposed Project, the same degree of mobilization of Lower Klamath Project reservoir sediment deposits would occur under the Partial Removal Alternative. The retention of some structures under the Partial Removal Alternative (e.g., powerhouse elements, penstocks, some buildings, see also Table 4.3-1 through Table 4.3-6) would not result in different impacts related to geology and soils compared with those described for the Proposed Project. Therefore, potential impacts under the Partial Removal Alternative would be the same as those described for the Proposed Project (Potential Impacts 3.11-1, 3.11-2, 3.11-3, 3.11-4, 3.11-5, 3.11-6, 3.11-7). As with the Proposed Project, Mitigation Measure GEO-1 would be required to be implemented as part of the Partial Removal Alternative to reduce potential impacts due to short-term hillslope instabilities during reservoir drawdown (Potential Impact 3.11-3).

#### 4.3.12 Historical and Tribal Cultural Resources

The potential impacts of the Partial Removal Alternative on Copco No. 1 Dam, Copco No. 2 Dam, and Iron Gate Dam, their associated hydroelectric facilities, and the Klamath River Hydroelectric Project District as a whole, would be less than those described for the Proposed Project (Potential Impact 3.12-11) because some of the Lower Klamath Project structures would be retained. The Partial Removal Alternative would retain (entirely or partially) the following structures of potential historical significance: Copco No. 1 powerhouse and penstocks; Copco No. 2 power penstock intake structure and gate, tunnel portals, steel penstock (including supports and anchors<sup>189</sup>), and powerhouse; and the lower portion of the Iron Gate Dam powerhouse (Table 4.3-1 through Table 4.3-6). Leaving these structures in place would reduce potential impacts to the proposed Klamath River Hydroelectric Project District relative to those described for the Proposed Project. However, impacts to the other structures of potential historical significance within the proposed Klamath River Hydroelectric Project District would still occur under this alternative. The Copco No. 1 Dam, gate houses<sup>190</sup>, warehouse and residence (Table 4.3-1), the Copco No. 2 Dam, spillway gates and structure, remnant cofferdam, wooden-stave penstock, concrete pipe cradles, oil and gas storage building, and certain features of the Copco Village, which are considered to be features of potential historical significance (Table 4.3-3), and the Iron Gate embankment dam,

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<sup>189</sup> Supports and anchors not specified as part of the National Register Eligibility Recommendation.

<sup>190</sup> While it would be possible to partially remove the gate houses, they are likely to be fully removed to facilitate construction access (e.g., to allow a large crane to access the site). For the purposes of this CEQA analysis, it is assumed that the gate houses would be removed.

penstock intake structure, penstock, spillway structure, fish facilities on the dam, and certain features of the additional ancillary facilities (Table 4.3-5), would still be removed under the Partial Removal Alternative. Removal of these features, or any others within the Klamath Hydroelectric Historic District that are determined to have potential historical significance through the FERC process, would result in the physical destruction of the resource or its immediate surroundings in a way that would materially impair the significance of the historical resource. Thus, while the impact to historical resources would be reduced as compared to the Proposed Project, the Partial Removal Alternative would still result in a significant impact on the historical built environment (Potential Impact 3.12-11). Further, for reasons described under the Proposed Project, the impact to the Klamath Hydroelectric Historic District would be significant and unavoidable even with inclusion of the KRRC's proposed mitigation measure (i.e., implementation of a final Historic Properties Management Plan and Programmatic Agreement).

The retention of the aforementioned structures under the Partial Removal Alternative would not result in different effects related to either historic-period archaeological resources or tribal cultural resources compared with those described for the Proposed Project. Therefore, potential impacts and beneficial effects on these resources and any associated mitigation measures under the Partial Removal Alternative would be the same as those described for the Proposed Project (Potential Impacts 3.12-1 through 3.12-10 and 3.12-12 through 3.12-16).

#### 4.3.13 Paleontologic Resources

The retention of some structures under the Partial Removal Alternative (e.g., powerhouse elements, penstocks, some buildings, see also Table 4.3-1 through Table 4.3-6) would not result in different impacts to paleontologic resources compared with those described for the Proposed Project. There would be no significant impact of the Partial Removal Alternative on paleontologic resources (Potential Impact 3.13-1).

#### 4.3.14 Land Use and Planning

The retention of some structures under the Partial Removal Alternative (e.g., powerhouse elements, penstocks, some buildings, see also Table 4.3-1 through Table 4.3-6) would not result in different potential impacts to land use and planning resources compared with those described for the Proposed Project. Thus, under the Partial Removal Alternative, potential impacts on land use and planning would be the same as those described for the Proposed Project (Potential Impacts 3.14-1 and 3.14-2) and there would be no significant impacts.

#### 4.3.15 Agriculture and Forestry Resources

The retention of some structures under the Partial Removal Alternative (e.g., powerhouse elements, penstocks, some buildings, see also Table 4.3-1 through Table 4.3-6) would not result in different impacts to agriculture and forestry resources compared with those described for the Proposed Project. Thus, under the Partial Removal Alternative, potential impacts on agriculture and forestry resources would be the same as those described for the Proposed Project and there would be no significant impacts (Potential Impacts 3.15-1 through 3.15-3).

#### 4.3.16 Population and Housing

Although there would be a decrease in construction-related activities under the Partial Removal Alternative due to several of the Lower Klamath Project structures remaining in place (Table 4.3-1 through Table 4.3-6), the number of temporary workers would not substantially change between the Proposed Project and this alternative since workers would still be needed for sealing and security fence installation around the structures that remain. Additionally, this alternative would adhere to the same schedule as the Proposed Project (Table 2.7-1) since it would require time to secure retained facilities by removing hazardous materials and installing fences (Section 4.3.1 [*Partial Removal Alternative*] Introduction – *Alternative Analysis Approach*). Thus, potential impacts to population and housing under the Partial Removal Alternative would be the same as those described for the Proposed Project (Potential Impacts 3.16-1 and 3.16-2) and this alternative would not induce substantial population growth or displace substantial numbers of people or existing housing. Implementation of the Partial Removal Alternative would have no significant impacts on population and housing.

#### 4.3.17 Public Services

Although there would be a decrease in construction-related activities under the Partial Removal Alternative due to several of the Lower Klamath Project structures remaining in place (see Table 4.3-1 through Table 4.3-6), the degree of difference would not be enough to significantly change the assessment of dam removal effects on public services compared with those described for the Proposed Project (Potential Impacts 3.17-1 through 3.17-3). This alternative would still result in significant impacts due to short-term increased response times for emergency fire, police, and medical services, increased risk of wildfires and the need for firefighting measures, increased need of police protection, and personal and public health and safety risks and need for medical services (Potential Impact 3.17-1). Implementation of Mitigation Measure HZ-1 (Section 3.21 *Hazards and Hazardous Materials*) would reduce impacts for reasons described under the Proposed Project. However, the KRRC is developing a Traffic Management Plan to identify mitigation and other protective measures that would be implemented to reduce impacts to public services. Overseeing development and implementation of a Traffic Management Plan does not fall within the scope of the State Water Board's water quality certification authority. While the State Water Board expects that the Traffic Management Plan will be finalized and implemented, at this time the plan is not finalized, and the State Water Board cannot require its implementation. Accordingly, while the State Water Board anticipates that implementation of HZ-1 and Recommended Measure TR-1 would reduce impacts to public services, because it cannot require implementation of Recommended Measure TR-1, it is analyzing the impacts under this alternative as significant and unavoidable.

Under the Partial Removal Alternative, elimination of the Lower Klamath Project reservoirs as a long-term water source for wildfire services and the associated increase in response times for fighting wildfires (Potential Impact 3.17-2) would result in the same impacts as described for the Proposed Project because removal of the Lower Klamath Project reservoirs would still occur to ensure a free-flowing Klamath River under all river stages and flow conditions. The KRRC is working on an updated Fire Management Plan to identify mitigation and other protective measures that would be implemented to reduce impacts to wildfire services. Overseeing development and implementation of the Fire Management Plan does not fall within the scope of the State Water Board's water

quality certification authority. While the State Water Board expects that it will be finalized and implemented, at this time the plan is not finalized, and the State Water Board cannot require its implementation. Accordingly, while the State Water Board anticipates that implementation of the Fire Management Plan and its incorporation of Recommended Measure PS-1 would reduce impacts to wildfire services, because it cannot require implementation, it is analyzing the impacts under this alternative as significant and unavoidable.

Potential impacts on school services and facilities (Potential Impact 3.17-3) under this alternative would be the same as described for the Proposed Project and would be less than significant.

#### 4.3.18 Utilities and Service Systems

Although there would be a decrease in construction-related activities under the Partial Removal Alternative due to several of the Lower Klamath Project structures remaining in place (Table 4.3-1 through Table 4.3-6), the degree of difference would not be sufficient to significantly change the assessment of dam removal activities on the need for wastewater treatment (Potential Impact 3.18-1) or the need for stormwater drainage facilities (Potential Impact 3.18-2) under the Proposed Project, and there would be no significant impacts to these service systems.

Under the Partial Removal Alternative, there would be a reduction in waste disposal as compared to the Proposed Project since numerous features listed in Table 4.3-2, Table 4.3-4, and Table 4.3-6 would not be demolished and would instead be either disposed of onsite or offsite, depending on the material (see also Potential Impacts 3.18-3 and 3.18-4). For example, the Copco No. 1 and 2 powerhouse cranes (multiple 40-ton travelling indoor cranes and 15-ton overhead cranes), and 1,400 feet of steel penstocks would remain under the Partial Removal Alternative, but would be demolished under the Proposed Project. Likewise, the concrete from the bottom portion of the Iron Gate Powerhouse would remain under the Partial Removal Alternative, but would be demolished under the Proposed Project. Since the anticipated volume of waste generation for the Proposed Project is less than the identified capacities for local landfill facilities (described in Section 3.18.2.4 *Solid Waste*), and the Partial Removal Alternative would result in less construction-related waste, there would be sufficient capacity to accommodate the solid waste disposal needs of the Partial Removal Alternative, and potential waste disposal impacts would be less than significant.

#### 4.3.19 Aesthetics

Although the Partial Removal Alternative would leave some Lower Klamath Project structures in place (see Table 4.3-1 through Table 4.3-6), the entirety of each dam would be removed to ensure a free-flowing Klamath River under all river stages and flow conditions. Thus, under the Partial Removal Alternative, the long-term change from open water lake vistas to river, canyon, and valley vistas would still occur and would not result in a significant impact (Potential Impact 3.19-1). In the short term, there would still be significant and unavoidable aesthetic impacts due to barren areas within the reservoir footprints, which would be created during reservoir drawdown and would remain until vegetation in previously inundated areas establishes (Potential Impact 3.19-4). As described for the Proposed Project, there would be no significant impacts to scenic resources resulting from changes in flows and channel morphology (Potential Impact

3.19-2) or increased turbidity and reduced clarity during reservoir drawdown (Potential Impact 3.19-3). Long-term changes in visual water quality (reduced algal blooms) would be beneficial (Potential Impact 3.19-3) under the Partial Removal Alternative for the reasons described under the Proposed Project.

The retention of some structures under the Partial Removal Alternative (e.g., powerhouse elements, penstocks, some buildings, see Table 4.3-1 through Table 4.3-6) would mean that the visual character of the Lower Klamath Project area would continue to be affected by the remaining man-made features. However, as the remaining features are already part of the existing conditions (i.e., environmental baseline), the aesthetic effect of removing the other large existing structures (e.g., dams, some buildings) the would be beneficial as compared with existing conditions, even though the benefits would be of a slightly lesser degree than those described for the Proposed Project (Potential Impact 3.19-5). Visual impacts due to construction of new infrastructure and improvements to existing infrastructure would be less than significant for the reasons described for the Proposed Project (Potential Impact 3.19-5). In general, short-term construction-related impacts to visual resources under the Partial Removal Alternative would be slightly less than those described for the Proposed Project and as such would be less than significant (Potential Impact 3.19-6). The exception to this is short-term lighting impacts; because construction would still occur at night over a period of several months, the potential impact due to construction lighting would also be significant for this alternative (Potential Impact 3.19-7). The Proposed Project currently does not include measures that would reduce impacts to nighttime views cause by temporary construction lighting. KRRRC proposes that KRRRC and the appropriate state or local agency would work together to develop recommended terms and conditions that should be adopted by FERC as conditions of approval for the Lower Klamath Project. This is consistent with FERC's preference for licensees to be 'good citizens' of the communities in which projects are located and thus to comply, where possible, with state and local requirements. It would be appropriate for any such terms to include measures to reduce nighttime light and glare on surrounding residences during construction. However, overseeing development and implementation of measures to reduce impacts to nighttime views does not fall within the scope of the State Water Board's water quality certification authority. While the KRRRC has stated its intention to reach enforceable good citizen agreements that will be finalized and implemented, at this time these agreements are not finalized and the State Water Board cannot require their implementation. Accordingly, while the State Water Board anticipates that implementation of the final FERC terms and conditions for the Proposed Project would reduce potential impacts to nighttime views to less than significant, because the State Water Board cannot ensure implementation of any associated measures, it is analyzing the impact in this Draft EIR as significant and unavoidable.

#### 4.3.20 Recreation

Since none of the structures that would be retained under the Partial Removal Alternative are related to recreation (see Table 4.3-1 through Table 4.3-6), and since the reservoirs themselves would not be retained, the potential impacts of the Partial Removal Alternative on recreational opportunities would be the same as those described for the Proposed Project and there would be no significant impacts in the short term (Potential Impacts 3.20-1, 3.20-2, 3.20-3, and 3.20-4). For reasons described under the Proposed Project, while there would be no short-term and long-term significant impacts to whitewater boating recreational activities in most Klamath River reaches, there would

be significant and unavoidable changes to Hell's Corner area in the upper Hydroelectric Reach in the short and long term (Potential Impact 3.20-5). In the short term, there would be no significant impact on non-boating river-based recreation (e.g., fishing) and in the long term there would be a beneficial effect (Potential Impact 3.20-6). Similarly, there would also be beneficial effects on the designated California Klamath River wild and scenic river segment, and eligible and suitable California Klamath River wild and scenic river section (Potential Impact 3.20-7).

#### 4.3.21 Hazards and Hazardous Materials

Although there would be a decrease in construction-related activities under the Partial Removal Alternative due to several of the Lower Klamath Project structures remaining in place (see Table 4.3-1 through Table 4.3-6), the degree of difference would not be enough to change the potential for hazard-related impacts due to transport or use of hazardous materials during construction activities, as compared with those described under the Proposed Project. Some of the features proposed to be retained under the Partial Removal Alternative may have coatings that contain heavy metals (such as the penstocks) and that would be exposed during or following construction activities. These features would require preservation under the Partial Removal to reduce the risk of environmental contamination. Overall, the hazards and hazardous materials-related potential impacts and mitigation would be the same as those described for the Proposed Project (Potential Impacts 3.21-1 through 3.21-7).

#### 4.3.22 Transportation and Traffic

Although there would be a decrease in construction-related activities under the Partial Removal Alternative due to several of the Lower Klamath Project structures remaining in place (Table 4.3-1 through Table 4.3-6), the degree of difference would not be enough to significantly reduce the potential effects of dam removal on construction-related traffic described for the Proposed Project (Potential Impacts 3.22-1 through 3.22-5). This is because while there would be less excavation and cut/fill activities than anticipated for the Proposed Project (due to the smaller construction footprint), the peak number of truck trips, construction equipment, or temporary workers would not substantially change between the Proposed Project and this alternative to allow for sealing of and fencing installation around structures that remain. Overall, transportation and traffic potential impacts would be the same as those described for the Proposed Project (Potential Impacts 3.22-1 through 3.22-5) and would be significant. The KRRC is working on developing a Traffic Management Plan and an Emergency Response Plan to identify mitigation and other protective measures that would be implemented to reduce potential impacts to transportation and traffic. Overseeing development and implementation of the Traffic Management Plan and the Emergency Response Plan does not fall within the scope of the State Water Board's water quality certification authority. While the State Water Board expects that these plans will be finalized and implemented, at this time the plans are not finalized, and the State Water Board cannot require their implementation. Accordingly, while the State Water Board anticipates that implementation of the Traffic Management Plan and the Emergency Response Plan would reduce impacts to transportation and traffic, because it cannot require implementation, it is analyzing the impacts as significant and unavoidable.

For reasons described under the Proposed Project (Potential Impact 3.22-6), this alternative would not require a change in air traffic that would result in substantial safety risks, and there would be no significant impact.

#### 4.3.23 Noise

Although there would be a decrease in construction-related activities under the Partial Removal Alternative due to several of the Lower Klamath Project structures remaining in place (Table 4.3-1 through Table 4.3-6), the degree of difference would not be sufficient to significantly reduce the potential effects of dam removal related to noise and vibration. Short-term construction related noise impacts due to any use of dozers, jackhammers, and/or tractors during the Partial Removal Alternative would constitute an exceedance of Siskiyou County maximum allowable noise levels and this would be a significant impact (Potential Impact 3.23-1). Deconstruction of Copco No. 1 Dam (Potential Impact 3.23-2), deconstruction of Iron Gate Dam (Potential Impact 3.23-4), restoration activities at Copco No. 1 and Iron Gate reservoirs (Potential Impact 3.23-5), and blasting at Copco No. 1 Dam (Potential Impact 3.23-6) would remain significant and unavoidable under the Partial Removal Alternative.

The analysis of the Partial Removal Alternative assumes that deconstruction techniques for this alternative are the same as for the Proposed Project, with no specialized means or methods necessary. The analysis also assumes that the Partial Removal Alternative would use the same equipment as the Proposed Project. Thus, as described for the Proposed Project, there would be no significant impacts from the Partial Removal Alternative due to construction activities associated with deconstruction of Copco No. 2 Dam (Potential Impact 3.23-3), the Downstream Flood Control project component (moving or elevating legally established structures located within the altered 100-year floodplain, where feasible) (Potential Impact 3.23-8), Mitigation Measure WSWR-1 (modify water intakes) (Potential Impact 3.23-9), and construction activities associated with the deepening or replacement of existing groundwater wells adjacent to the reservoirs (Potential Impact 3.23-10).

Under the Partial Removal Alternative, waste disposal would be somewhat reduced as compared to the Proposed Project since numerous features listed in Table 4.3-2, Table 4.3-4, and Table 4.3-6 would not be demolished, and would either be disposed of on-site or off-site, depending on the material (Compare with Potential Impacts 3.18-3 and 3.18-4). As the Partial Removal Alternative would result in less construction-related waste than the Proposed Project (see Potential Impact 3.18-7), the need to transport waste to off-site landfills and construction worker commutes would likely be reduced under the Partial Removal Alternative. Transporting waste off-site and construction worker commutes would result in less than significant noise impacts for receptors 50 feet or more from all local roadways under the Proposed Project. Since there would be a reduction of this impact under the Partial Removal Alternative as compared to the Proposed Project, there would be a less than significant impact.

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